

A NEW SPECIES OF GOMPHUS FROM ALABAMA
(ODONATA)

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In *A Manual of the Dragonflies of North America* (1955) the distribution of *Gomphus fraternus* Say includes the area from Maine west to Minnesota and as far south as Virginia, with the three Canadian provinces of Quebec, Ontario, and Manitoba representing the northern boundary. The species is also reported from the southern states of Texas, Arkansas, Mississippi, Alabama and Florida. Specimens from Kentucky have been sent to me by Carl Cook, and they are undoubtedly of this species. In the light of recent findings it becomes necessary to examine critically all records for *fraternus* from south of Kentucky.

The record for Florida was based upon one female seen in the Cornell University collection. The specimen was reported (Westfall, 1953) with some reservation as an addition to the state list. It was taken at River Junction, Gadsden County, on April 9, 1927, and was determined as *fraternus* by J. G. Needham. Since the specimen was subsequently lost and since the closely related *G. hybridus* Williamson was taken by me in this same area, it was included mainly on the basis of existing records for *fraternus* from Alabama, Arkansas, and Mississippi. Further study shows that these two species have been confused several times and it is almost certain that this female was really *hybridus*. I am therefore removing *fraternus* from the Florida list until there is better evidence for including it.

Gomphus fraternus had earlier (Westfall, 1952) been added to the list known from Mississippi. This was based upon three specimens collected by Mrs. Alice L. Dietrich and deposited in the Cornell University collection. Two were from George County, a female from Lucedale, May 20, 1931, and a male from North, April 13, 1931. The third, a male, was from the Leaf River at New Augusta in Perry County, April 30, 1931. These specimens were sent to E. B. Williamson for identification. He labeled them all as "*Gomphus* sp. A", and in addition on the envelope of the female had written the following: "near sp. I identified from Texas as *consanguis* but apparently not identical. E. B. W. 1/16/32".

Subsequently, Dr. Needham identified them as *fraternus*, and this was the name under which they were reported. After collecting numbers of *G. hybridus* in Florida and comparing them with the Mississippi specimens and with a paratype, I am convinced that the Mississippi specimens are *hybridus*. Mr. Williamson described this species in 1902 from specimens taken in Tennessee, many of which were teneral, and until recently it was recognized only from the type series. He did not publish an illustration with his description, and apparently failed to recall this species when identifying the Mississippi specimens. We must now delete *fraternus* from the Mississippi list and add *hybridus*.

The Arkansas record was based upon the male and female reported by Calvert (1901). The male was from Jemmy's Creek, May 17, 1897 and the female from White River, June 10, 1897. Through the kindness of Dr. Calvert these specimens were borrowed from the Philadelphia Academy of Natural Sciences. They were badly broken upon receipt, but could be readily identified as *hybridus*, not *fraternus*. We must delete *fraternus* from the Arkansas list until authentic specimens of this species are found, adding *hybridus* in its place.

Texas was included in the distribution of *fraternus* solely on the basis of the inclusion of that state in the range as given by Williamson (1900). I am unable to learn upon what specimen his record was based. Muttkowski (1910) did not include Texas in his distribution for this species. Edward J. Kormondy has written me that there are no specimens of *fraternus* from southern states in the Williamson Collection at Ann Arbor. The Texas record is apparently in error and perhaps was based upon a specimen of *hybridus*. George Beatty has loaned me for study a male specimen of *hybridus* collected May 7, 1952 at Commerce, Hunt County, Texas, by Alice Ferguson et. al. It agrees well with the paratype and my specimens from Florida. With Mr. Beatty's permission I am reporting this as the first known record of the species from Texas. George Bick during many years of collecting has not taken *fraternus* or *hybridus* in Louisiana.

This leaves the Alabama record to discuss. We included this state on the basis of a list of species collected in Alabama by Septima Smith and Robert H. Hodges. This list was photostated and distributed to colleagues, and bears the date January 1, 1939. I have examined the specimens upon which their record for *frater-*

nus was based, and have determined that they are neither *fraternus* nor any other described species. Mrs. Leonora K. Gloyd in 1939 had noted on the reverse of some of the labels, "near but not *fraternus*". Drs. Smith and Hodges have turned the specimens over to me for description, and Mrs. Gloyd has graciously declined any right of prior discovery.

This species is named for Dr. Septima Smith in recognition of the contribution she has made to our knowledge of the Odonata of Alabama.

GOMPHUS SEPTIMA n. sp.

DESCRIPTION OF HOLOTYPE MALE.—General color dark brown to blackish, with pale areas greenish unless otherwise stated.

Head.—Labium pale, the tips of median and lateral lobes slightly suffused with chestnut brown. Tips of maxillae brown to black. Face pale, with pits at ends of suture between labrum and anteclypeus dark brown. Slight darkening along sutures between labrum and anteclypeus and between frons and postclypeus. Top of frons pale, a narrow brown line at its base where it joins the brown vertex. Transverse postocellar ridge with only a few hairs, its outer corners pale. Occiput pale, its crest slightly convex, almost straight in middle, and clothed with brown pubescence. *Pronotum* with anterior lobe yellow in middle, brown laterally. Median lobe pale with brown markings dorsally, and dark brown laterally above the prothoracic coxae and around the prothoracic spiracle. *Synthorax* with middorsal carina and collar pale. Middorsal brown stripe widened anteriorly to become slightly wider than the pale area bordering it on each side. Antehumeral and humeral brown stripes of about equal width, the antehumeral not attaining the crest above, but fused in its upper part with the humeral. The two are also joined slightly at their lower ends. Narrow brown stripe just anterior to lower end of first lateral suture extends upward to level of spiracle which is ringed with black. Second lateral suture suffused with light brown near its upper end. Legs brown to black beyond their pale basal segments. Tibiae unmarked with yellow. Medial surface of prothoracic femora pale. Wings with costa yellow, venation brown to black, stigma brown. No useful specific characters noted in venation. *Abdomen* mostly dark brown, becoming almost black on middle segments. Dorsal pale band extends full length of segments 1-6, becoming pointed at apices of 4-6, and ending

about middle of 7. Segments 8-10 unmarked dorsally. Sides of 1 and 2, and about anterior half of 3 broadly pale upward to level of dorsal part of auricle. Segment 1 with a dense patch of long dark hair just above level of auricle, also with a shining black prominence on posterior margin of segment at lower edge of hairy patch. Upper surface of auricle on segment 2 in part brownish, with the posterior edge bearing about two dozen black prickles. Segments 4-9 with basal pale spots on sides, increasing from less than a fifth the length of segment 4 to half length of 8. Almost entire expanded ventral border of 9 is yellow and the yellow extends dorsally for a distance equal to about half the length of segment. Appendages brown, inferior becoming black in distal half. Superiors about twice length of segment 10, and only slightly longer than inferior. In lateral view each superior bears on its lateral surface a ventrally directed, rounded prominence which is not visible in dorsal view. From this prominence the ventral margin runs upward in a slight curve, then almost straight for a distance equal to about a third the distance from rounded prominence to tip of appendage. It then bends sharply dorsally to the acute apex. The inferior is upturned at its apex. In dorsal view the branches of the inferior project laterally beyond the tips of the superiors for a distance about equal to the width of the tips of the branches. The posterior edge of the inferior forms a straight line in the middle, but the connections with the arching lateral branches are visible from this dorsal view.

Posterior hamules strongly rotated medially so that the tips and "shoulders" are hardly visible in lateral view. Penis with the terminal segment shorter than the third segment. The "tails" of the terminal segment very short and upturned.

DESCRIPTION OF ALLOTYPE FEMALE.—Coloration similar to male holotype. Pale markings of abdomen more extensive. Dorsal stripe almost full length on segment 7 and a small basal spot on 8 about one-eighth the length of segment. Lateral pale areas almost full length on middle segments. Occiput strongly notched in middle, convex each side of the notch. Vertex with a small brown spine arising a short distance away from the transverse postocellar ridge, so as to lie between each lateral ocellus and the eye (i.e., on the shortest line between these two parts). Abdominal appendages almost twice as long as segment 10. Sub-

genital plate (vulvar lamina) almost half as long as segment 9, the two branches contiguous basally and divergent in apical third.

VARIATIONS.—In one male, segment 3 is pale laterally in about the anterior three-fourths of its length, in another pale in almost its entire length. In one male there is a minute dorsal spot at base of 8; in another this spot is about one-seventh the length of segment 8. In two males the dorsal pale area on 7 covers a little more than one-half of length of segment. The rounded protuberance about midlength of the superior appendage may be quite sharp in some specimens. In one male the branches of the inferior appendage as seen in dorsal view project laterally beyond the tips of the superiors for a distance equal to about one and one-half times the width of the tips of the branches.

In two females the spines of the vertex are considerably smaller than in the allotype, but the position is the same. Two females have a pale basal spot on the dorsum of 8. The pale area on side of 9 may be slightly less extensive than in the allotype. In one female the dorsal pale area covers the basal three-fourths of segment 7.

MEASUREMENTS.—Male holotype, total length 60 (millimeters), abdomen including appendages 43, hind wing 32, superior appendages 1.9. Allotype female, total length 57, abdomen 41, hind wing 35. Paratype males, total length 59-62, abdomen 43-46, hind wing 32-34. Paratype females, total length 53-57, abdomen 39-42, hind wing 34-36.

HOLOTYPE.—Male, collected on Warrior River above Blue Creek, Tuscaloosa County, Alabama, May 23, 1940 by Robert S. Hodges. Deposited in University of Florida Collections.

ALLOTYPE.—Female, collected on Warrior River, Lock 16, Tuscaloosa County, Alabama, May 17, 1938 by Robert S. Hodges. Deposited in University of Florida Collections.

PARATYPES (5 ♂♂, 4 ♀♀).—All from the Warrior River, Tuscaloosa County, Alabama; 2 ♂♂ (one with abdominal segments 5-10 missing) May 17, 1938; 3 ♂♂ (one in alcohol, with hamules and penis removed) May 23, 1940; 1 ♀ May 30, 1937; 1 ♀ June 2, 1937; 1 ♀ May 28, 1939; 1 ♀ (head missing) May 23, 1940. Another male taken May 23, 1940 is represented only by head, thorax, one leg, wing bases and abdominal segments 1-4. All were collected by R. S. Hodges with the exception of the female taken

May 28, 1939 by "The Dragonets". All specimens were shot and suffered some breakage. The one male so badly broken was not designated as a paratype though it is clearly the same species. All paratypes are at the present time in the University of Florida Collections, but some may be distributed to other collections.

REMARKS.—Of the three species of *Gomphus* considered in this paper, *hybridus* may readily be separated from *fraternus* and *septima* by its browner coloration. The other two are both blackish species. As Calvert pointed out for the Arkansas specimens which he called *fraternus* in 1901, *hybridus* males and females have "the side of the thorax, between the first and second lateral sutures filled solidly with pale brown". This diagnostic character is easily seen. The posterior hamules of *septima* are strongly rotated toward the midline so that, when in normal position, the tips and "shoulders" are hardly if at all visible from a lateral view. In *hybridus* there is no such rotation, and in *fraternus* the degree of rotation is only slight. The male of *fraternus* has the posterior edge of the inferior appendage when seen in dorsal view forming a long straight line, the connections with the lateral branches hidden below the superiors. In *septima* the straight line is not so long and the arching sides of the lateral branches give the impression of a concave posterior edge, straight only in the middle. In *hybridus* the straight portion of the posterior edge is still shorter, and the edge appears more concave. In the same view the branches of the inferior are seen to project laterally far beyond the tips of the superiors in *fraternus*, scarcely at all in *hybridus* and *septima* (see fig. 1 in this paper, also figs. 109 and 110 in the *Manual of Dragonflies of North America*). The dorsal view of *fraternus* on page 91 of the *Handbook of Dragonflies of North America* (1929) was apparently transposed with the dorsal view of *hybridus* on the same page. In lateral view the male superior appendage of *septima* (figs. 2 and 6) is different from that of either *fraternus* or *hybridus* (figured in the *Manual*).

The occiput of the female is notched in the middle and convex each side in *septima*, emarginate or toothed in the middle in *fraternus*, and smoothly convex throughout in *hybridus*. The tips of the subgenital plate of *fraternus* are in general more divergent than in *hybridus* and *septima*, but the three species are very much alike in this respect as shown by the figures. In *septima* the spines of the vertex are removed a short distance from the transverse

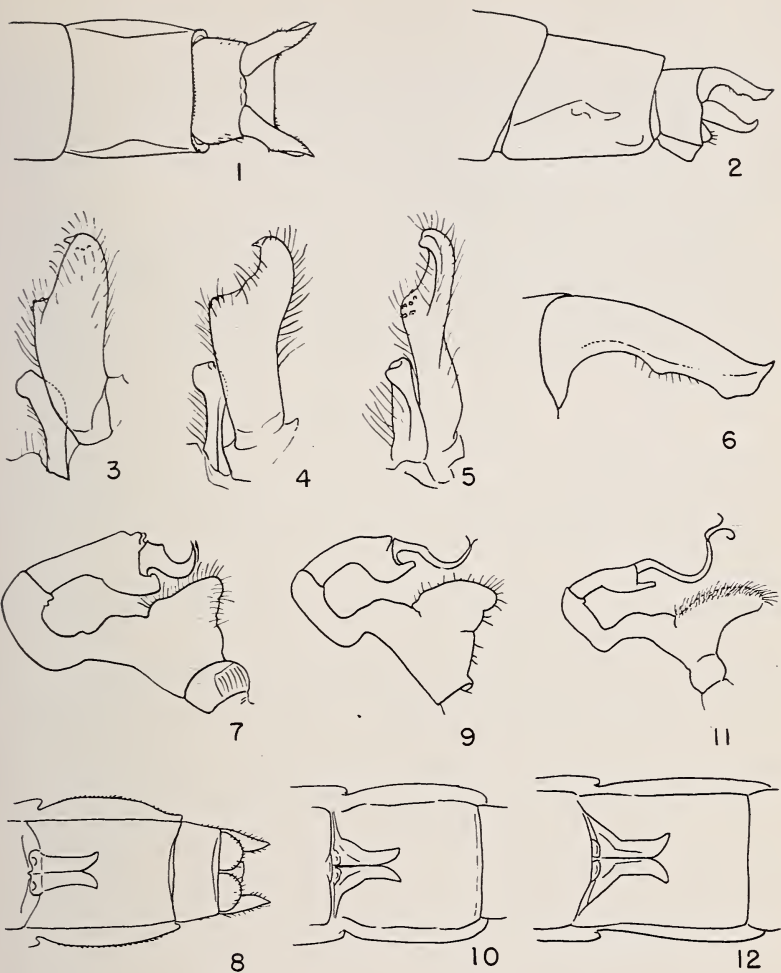


PLATE 1¹

Figs. 1-8, *Gomphus septima* n. sp. Figs. 9-10, *G. hybridus*.

Figs. 11-12, *G. fraternus*.

Fig. 1, Dorsal view of abdominal segments 9, 10, and appendages of male.

Fig. 2, Lateral view of same. Fig. 3, Hamules of second abdominal segment of male almost as they appear in lateral view of insect. Fig. 4, Same hamules rotated slightly. Fig. 5, Same hamules rotated more. Fig. 6, Lateral view of left superior appendage of male. Figs. 7, 9, and 11, Penes of males. Fig. 8, Ventral view of abdominal segments 9, 10, and appendages of female. Figs. 10 and 12, Ventral views of abdominal segment 9 of females.

¹ I am indebted to Miss Esther Coogle, Staff Artist, Department of Biology, University of Florida, for the drawings in this paper.

postocellar ridge, lying on the shortest line between the lateral ocellus and the compound eye. In *hybridus* and *fraternus* the spines are much smaller and are at the ends of the transverse ridge. In this character *septima* is more like *crassus* but is very different in most other respects.

The penis of *septima* differs from that of *fraternus* or *hybridus*, especially in the shape and length of the terminal segment. In *septima* the terminal segment is definitely shorter than the third segment, in the other two species longer. The peduncle of *fraternus* is slender, recurved, and much more hairy than that of *septima* or *hybridus*.

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